

Effluent Management on the North Slope

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Good afternoon. I am going to spend a few moments to focus on the evolution of effluent disposal from exploration & production operations in Alaska. My observations are based upon experience as a waste generator when I worked on drilling rigs to my current role of being responsible for field environmental compliance.

Our industry has learned a lot about effluent management in the arctic over the past 25-30 years. This morning you heard about grind and inject technology and how it changed the way we manage muds & cuttings. G & I is a prime example of utilizing technology to improve an environmental management system. This permanent and environmentally sound disposal method isolates wastes, eliminates subsequent disposal and greatly reduces the surface space required for drilling operations. In 1999 over 10 million barrels of muds/cutting were successfully managed at G & I in the Eastern Operating Area of Prudhoe Bay.

Another option for handling drilling muds & cuttings is annular pumping. In this application, drilling wastes generated from the construction of new wells is pumped down the annulus, below the permafrost, which can be as deep as 2000 feet. In both of these applications, design and construction activities must be approved by appropriate regulatory agencies.

Produced water represents a major effluent from our production operations. Produced water is re-injected into the reservoir to help produce more oil, called water flooding. Excess produced water is injected below the permafrost into a confining zone. In 1999 ARCO Alaska successfully re-injected over 69 million barrels of produced water.

Non hazardous E & P effluents are managed in EPA administered Class 1 non-hazardous disposal wells. Up until 1997 only 3 Class 1 wells were permitted in EPA Region 10. They are located in the Eastern Operating Area of Prudhoe Bay, managed by ARCO Alaska Inc. Today there are several more Class 1 wells in the arctic to support activities from recent discoveries. (i.e.: Badami & Alpine). The 3 Class 1 wells in the Eastern Operating Area of Prudhoe Bay are approximately 2200 feet deep, completed just below the permafrost. The injection zone is composed of loosely consolidated sands & gravel with a porosity of 25% and a permeability ranging from 1-2 darcies. The surface facility consists of 3 injection pumps; surge tanks, solids removal equipment and a lined off-loading area for tank trucks. With the exception of a small volume of snow melt water from an adjacent drill site, all fluids injected in Pad 3 are trucked in. During the past 10 years of the existing EPA UIC permit at Pad 3, 7.5 million barrels from 40,000 truckloads have been successfully injected as Pad 3.

In addition to location, design and construction, an effective training and management system is crucial to the successful operation of an underground injection facility. I would bet our employees & contractors in Alaska have had more environmental management training and are more knowledgeable about regulations than most. Generators, transporters and receivers of waste are certified by attending waste-management training. A North Slope wide manifest system is utilized to document each load from its point of generation to its final destination. Refresher training is required to provide updates on regulatory or procedural changes. This morning I spent 2 hours with 15 others in a "train the trainer" session for the new Alaska Disposal and Reuse Guide.

Our industry has come a long way in improving the management of E & P effluent. Pollution prevention & waste minimization programs are effective in minimizing quantities. Programs like Green Star promote pollution prevention and waste minimize and recognize companies for their successes. ARCO Alaska was the first North Slope operator in Alaska to receive Green Star recognition.

As we move into the future, underground injection will play a key role in the effective, environmentally sound management of E & P effluent. Our industry has been working with regulatory agencies to expand the use of underground injection, to include other non-hazardous materials. In 1999 over 80 million barrels of oil field effluent from ARCO Alaska facilities have been successfully managed on the North Slope utilizing underground injection technology.

With proper planning, facility location, design and construction, coupled with an effective training and management system and monitoring plan, underground injection has proven to be an effective environmentally sound method to manage oil field effluent in Alaska. Thank you for this opportunity to talk about this subject. I'll take any questions at this time.